

A FINANCIAL ANALYSIS AND CREDIT GAP ASSESSMENT OF MADURAI MALLI FLOWER IN MADURAI DISTRICT OF TAMILNADU

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ABSTRACT

Global competitive environment in recent trend shifts towards traditional products of quality with a strong cultural link particular geographical origin, with the opportunity to move away from commodity markets into more profitable markets through differentiation. Thus, geographical indications(GI) act as a protection measure for both consumers and producers apart from solving problems that arise from information asymmetry and free riding on reputation. One such GI tagged product from Tamil Nadu is Madurai malli. The paper has determined to assess the financial feasibility of Madurai malli cultivation in Madurai district of Tamil Nadu. Primary data was collected with the aid of a well-structured and pre tested schedule from a random sample of 120 farmers. The findings showed that Madurai malli cultivation was economically viable and financially feasible in the area of study. The average cost of establishing a Madurai malli farm was found to be Rs. 204224.00/acre for the first year. The cost and returns incurred in cultivation for the subsequent years after establishment was calculated on an annual basis. Results of the financial feasibility measures show that the Net Present Value at 12 per cent discount rate, at the end of seven years was found to be positive, Benefit-Cost ratio was more than one and Internal Rate of Returns for Madurai malli cultivation was very high with a payback period of around 1year and 3 months. Credit facilities for the crop is solely provided by the National Agricultural Bank for Rural Development (NABARD) through cooperatives functioning in the study area from which the credit gap prevailing was assessed from the total variable costs incurred annually. The credit gap was found to be Rs. 144734.00/acre/year over the variable costs on an average. The study has recommended that farmers investment on Madurai malli cultivation was feasible but the credit needs of the farmers has to be fulfilled by the financial institutions.

KEYWORDS: Benefit-Cost Ratio, Economic Feasibility, Financial Feasibility, Internal Rate of Returns, Net Present Value, Credit Gap, Investment, Madurai Malli & Jasmine

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INTRODUCTION

Floriculture is an important component of Agriculture which has gained commercial tone in the recent years and has a very significant share in the economy of the country. India is the largest producer of Jasmine and marigold. Jasmine (*Jasminum sambac*) also called the “Queen of fragrance” is one among the leading exported loose flower from India. It is a perennial and water intensive crop with a life span of about 12-15 years. The major areas under jasmine crop are Tamil Nadu, Karnataka in South and West Bengal in East. Tamil Nadu ranks first in India in loose flower production and Jasmine cultivation with 18 per cent of the total area under loose flowers. Among the area cultivated under loose flowers, 62 per cent of the total area belongs to Jasmine cultivation in Tamil Nadu. The total area under jasmine cultivation in Tamil Nadu is nearly 11723 hectares with an annual production of 1,09,629 tonnes during the year 2017-18. The flowers harvested in the state are exported to neighbouring countries

like Sri Lanka, Singapore, Malaysia and the Middle East. Among all the districts of Tamil Nadu, Madurai accounts for the largest area of jasmine cultivation with 1480 hectares and an annual production of 15658 tonnes in 2017-18. Madurai malli is the first flower crop to gain Geographical indication (GI) in Tamil Nadu. The specialty of Madurai malli is its unique fragrance which is absent in jasmine flowers from other parts of the state. It is mainly due to the soil which has got aromatic alkaloids like “jamone” and “alpha terpineol”. Geographical indications tend to enhance the market price of a product thereby ensuring the livelihood of the producers. Similarly, the consumers are provided with guaranteed quality of products which can have a significant influence on the economic performance of the product. Modernisation of agriculture has increased the use of inputs especially seed, fertilizers, irrigation water, machineries, implements etc. which has further increased the demand for agricultural credit. There is a positive association between agricultural credit and agricultural production in India and the agricultural sector deserves continued policy support in credit in order to move onto a sustainable and higher growth path (Pallavi chavan *et al.*). World Bank has also stated that “Training farmers combined with increasing access to finance or the inputs required for agriculture acts as an impetus for improving agricultural productivity. Also providing cooperatives with resources improves linkages between agribusinesses along the value chain.” (World Development Report, 2019). In this context, the present study was taken up to analyse the financial feasibility of Madurai malli farms and to assess the credit gap prevailing at the farm level.

METHODOLOGY

The study was carried out in Madurai district as it is one of the major Jasmine Producing areas of Tamil Nadu and it occupies about 12.6 per cent of total Jasmine cultivated area. Primary data was mainly cross-sectional collected from 120 Madurai malli growing farmers randomly selected from a list of Malli growers in the following blocks: Thiruparankundram and Thirumangalam for the 2017-18 production seasons. In each block, 60 Malli growing farmers were randomly selected. Structured questionnaire was the main instrument used to collect the primary data. Primary data from the sample farms were collected with the help of a pre-tested interview schedule through personal interview. The information regarding the basic details of the farmer, family size, resource availability, land use, crop enterprise, cost of cultivation, maintenance cost of livestock, income generated from crop, livestock, off-farm and non-farm enterprises, farmer's cash expenses, borrowings, repayments, investment details and problems in borrowing were collected from the respondents. Secondary data like the location of the study area, land use pattern, soil type, area and production details of the crop, cropping pattern, climate, rainfall pattern, irrigation pattern, demography and financial institutions *etc.*, were obtained from district statistical office and loan details was collected from the Cooperative banks functioning in and around Madurai District.

The choice of the statistical and econometric tools was decided with reference to the objectives of the study and the nature of the data collected. Total life span of a Jasmine crop is usually 12-15 years but based on the survey, jasmine cultivating period of the sample farms were fixed at a maximum of 7 years since most of the farmers felt that it is not economical to cultivate the crop any further. Economics of Jasmine cultivation was calculated year wise from the data obtained through survey. The data were analyzed by using Investment analysis to find the Net Present Worth (NPW), Internal Rate of Return (IRR), Benefit Cost Ratio (BCR) and Payback period of Jasmine cultivation in the study area.

Net Present Value: The NPW is the total present value of future revenue and cost of an activity (Castle *et al.*, 1987). Net present value was computed using the following formula.

$$\text{Net Present Worth} = \sum_{t=1}^n \frac{B_t - C_t}{(1+i)^t}$$

Where notations are explained as

B_t = benefits in each year

C_t = costs in each year

n = number of year

i = interest rate.

Internal Rate of Returns: The IRR represents the return (in present terms) earned on an investment over its economic life. It is defined as that interest rate which, when applied to the cash flows generated by an investment, will equate the present value of the cash inflows to the present value of the cash outflows. The IRR was estimated as follows,

$$\text{IRR} = \text{Lowest interest rate} + \frac{\text{Difference between the two discount rates} \left(\frac{\text{Present worth of cash flow at lower discount rate}}{\text{Sum of the absolute value of the two NPVs}} \right)}$$

Benefit Cost Ratio: The benefit cost ratio of an investment is the ratio of the discounted value of all cash inflows to the discounted value of all cash outflows during the life span of jasmine production period. The higher the BCR better the investment. It is calculated by using following formula.

$$\text{Benefit Cost Ratio} = \frac{\sum_{t=1}^n \frac{B_t}{(1+i)^t}}{\sum_{t=1}^n \frac{C_t}{(1+i)^t}}$$

Where, B_t = benefits in each year,

C_t = costs in each year,

n = number of year,

i = interest rate.

The discount rate was assumed as 12 per cent for the analysis of the present study since the prevailing rate of interest for long term commercial banks is around 12 per cent. The credit gap prevailing among the jasmine farmers in the study area was calculated from the details obtained from the Cooperative banks.

Pay Back Period: The Pay Back Period (PBP) is the duration of time in years taken to liquidate the investment. The payback period was estimated by summing up all the undiscounted net benefits over the years to make up the initial investment incurred for establishment.

$$\text{PBP} = \frac{\text{Initial Investment}}{\text{Average annual net returns}}$$

Credit Gap Analysis

Total variable cost of a farm is dependent on production output. As the volume of production and output increases, variable costs will also increase. Credit provided should be able to cover the variable expenses of the farm. Hence the difference over the variable cost is calculated every year to find the credit gap prevailing in the farm.

RESULTS AND DISCUSSIONS

Establishment Cost of Jasmine Garden

The establishment cost per acre of the jasmine garden in Madurai district of Tamil Nadu was estimated for the year 2017-18 with the quantity of inputs and labour used at current market prices in Table 1. Average labour cost and material cost for the Madurai malli farms during the year of establishment was Rs.95591.00 and Rs.94170.00/acre per year respectively. The total cost of establishment of Madurai malli farms on an average was found to be Rs.204224.00/acre per year. Out of this, the labour and material costs accounted for Rs. 95591.00/acre/yr and Rs. 94170.00/acre/yr, respectively.

Table 1: Average Establishment Cost of Jasmine Farms in Madurai District

S. No.	Particulars	Labour Man - Days (No.)	Amount (Rs/acre//Year)
I.	Labour Cost		
1.	Land preparation	6.49	2597.00
2.	Trenching	23.56	9424.00
3.	Preparation of water canals	24.62	9848.00
4.	Planting	22.93	9170.00
5.	Fertilizer application	7.57	3026.00
6.	Spraying	5.1	2042.00
7.	Weeding	141.84	56736.00
8.	Fencing	6.87	2748.00
	Total Labour Cost	238.98	95591.00
II.	Material Cost		
9	Planting material		35250.00
10	Neem cake and FYM		4298.00
11	Fertilizers		45355.00
12	Plant protection chemicals		1425.00
13	Fencing material		7842.00
	Total Material Cost		94170.00
14	Transport cost for purchasing grafts		1263.00
15	Rental value of own land		12000.00
16	Interest on fixed capital (10%)		1200.00
	Total Establishment Cost		204224.00

Cost of Cultivation of Jasmine in Different Age Group of Gardens

Cost of cultivating Madurai malli in subsequent years after the establishment of the crop is tabulated in Table 2. It can be visualized from the table that the cost of cultivation of the crop increases with its age. For the second year, no pruning was taken up as the crop was just established. Annual maintenance cost for the second year was Rs.148074.00/acre which increased gradually with years and reached a peak of Rs.298917.00/acre at the seventh year of cultivation. The average cost of cultivation for the total life span of the crop was found to be Rs.229882.00 per acre.

Labour Man-Days Required for Different Age Groups of Madurai Malli Gardens

Table 3 depicts the number of man-days required for taking up every operation in Madurai malli field. It can be observed that harvesting operation consumes a large amount of labour man-days (On an average, 132.76) throughout the

life span of the crop with a highest value of 188.57 during the sixth year. Weeding operation constitutes for the second highest man days requirement of 92.58 labour days on an average. It can be seen that the number of man-days required for weeding decreases with the increasing age of the crop. This is due to the fact that as the crop grows, it establishes a smothering effect on weeds which naturally reduces the weed incidence in the field.

Cost and Returns Structure of Madurai Malli

The costs, and returns structure of jasmine in different age plants have been presented in table 4. It is evident that the yield per hectare was increasing year by year and will be reaching its maximum at the age of 4th year and then starts declining. The yield of the flower crop per acre was initially 715.36 kg/acre during the second year which gradually increased till the fourth year with an average yield of 2113.59 kg/acre and then there is a gradual decline in yield reaching 1404.60 kg/ac in the seventh year. The total yield and average yield for the total period of crop was found to be 9835.62 kg for seven years and 1639.27 kg per acre per year respectively. The gross return from the crop was found to be increasing from second year onwards till the end of sixth year. The average gross and net returns for a period of seven years were accounted to be Rs. 544031.00 and Rs. 351962.00 respectively.

Financial Feasibility of Investment in Madurai Malli Gardens

Net present value, benefit cost ratio, payback period and internal rate of return were employed to evaluate the feasibility of investment in Madurai malli orchards which is presented in table 5. The net present worth was Rs.1063636.00 per acre at 12 per cent discount rate. Thus it could be concluded that investment in Madurai malli cultivation is economically feasible. The higher magnitude of the net present value may be attributed to the fact that the initial investment and maintenance costs in Madurai malli cultivation was lesser when compared to the returns realised. The benefit cost ratio at 12 per cent discount rate was found to be 1.95 which was more than unity indicating that investment in Madurai malli cultivation is financially viable. Similar findings were reported by Kumar et al., (2013) who observed that the benefit – cost ratio for jasmine was 2. This could be because of less initial investment for establishment of a jasmine orchard. The payback period of the present study was found to be 1 year and 3 months. This clearly indicates that it would take a period of more than a year to recover the entire investment. This could be attributed to the fact that the initial investment itself was lower, besides higher rate of returns. However, this criterion neglects the net returns realized by the farmers in the subsequent years which may be more significant in the case of a long term enterprise like Madurai malli. The Internal rate of return was found to be very high, compared to the opportunity cost of capital indicating that the investment in Madurai malli cultivation was highly profitable, economically feasible and financially viable.

Credit Gap Analysis

The sample Madurai malli growers in the study area avail credit facilities only from the cooperative society functioning in that area which is funded by NABARD. The cooperative society provides a credit of Rs. 26975.00 per year with 7 per cent interest for a year. The 7 per cent interest rate could be subsidized when the loan amount is repaid within a year of borrowing. Credit gap experienced by the Madurai malli growers is calculated and tabulated in table 6. The average credit gap assessed was about Rs.185342.00/ac/yr for a period of seven years. The amount of credit gap prevailing tends to be lesser in initial years i.e., Rs.108052.00/ac/yr which gradually increases and reaches a peak of Rs.249133.00/ac/yr in the seventh year. This indicates that the credit provided by the financial institutions is not sufficient to cover the total variable costs involved in cultivation of Madurai malli in the study area. Hence, financial institutions must take proper steps to

increase the scale of finance provided for the Madurai malli crop thereby encouraging the farmers to take up Madurai malli cultivation on a large scale.

Table 2: Cost of Cultivation for different Age Groups of Madurai Malli Garden

SI. No	PARTICULARS	AGE OF THE GARDEN (in Years)						Average Amount (Rs/acre/year)
		2	3	4	5	6	7	
I.	Labour Cost							
1	Fertilizer application	4425.00	5384.00	6279.00	8113.00	8634.00	12662.00	7583.00
2	Irrigation	8212.00	8375.00	10607.00	14038.00	16826.00	17647.00	12618.00
3	Spraying PPC	1203.00	2456.00	3313.00	3923.00	8396.00	12918.00	5368.00
4	Earthing up	807.00	1638.00	1863.00	2165.00	2498.00	3047.00	2003.00
5	Weeding	48263.00	44652.00	37708.00	30046.00	27896.00	33603.00	37028.00
6	Pruning	-	1797.00	1848.00	2571.00	2361.00	5397.00	2794.00
7	Picking/Harvesting	23017.00	50541.00	66808.00	53599.00	75428.00	49202.00	53099.00
	Total Labour Cost	85927.00	114843.00	128426.00	114455.00	142039.00	134476.00	120028.00
II.	Material Cost							
8	Fertilizers	23617.00	26891.00	29663.00	41644.00	38515.00	25506.00	30973.00
9	Plant protection chemicals	933.00	2124.00	5421.00	17188.00	20057.00	45310.00	15172.00
	Total Material Cost	24550.00	29015.00	35084.00	58832.00	58572.00	70816.00	46145.00
10	Interest on working capital (7%)	1719.00	2031.00	2456.00	4118.00	4100.00	4957.00	3230.00
	Total Variable Cost	135027.00	172873.00	198590.00	232119.00	259183.00	276108.00	212317.00
III.	Fixed Cost							
12	Rental value of own land	12200.00	13420.00	14762.00	16238.00	17862.00	19648.00	15688.00
13	Interest on fixed capital (10%)	1220.00	1342.00	1476.00	1624.00	1786.00	1965.00	1569.00
	Total Fixed Cost	13047.00	14589.00	16312.00	18240.00	20396.00	22808.00	20359.00
	Total Cost	148074.00	187462.00	214902.00	250359.00	279579.00	298917.00	229882.00

Table 3: Labour Man-Days Required for different Age Groups of Madurai Malli Cultivation

SI. No	Particulars	Age of the Garden (in Years)						Average Labour Man-Days/AC/YR
		2	3	4	5	6	7	
1	Fertilizer application	11.06	13.46	15.70	20.28	21.59	31.59	18.96
2	Irrigation	20.53	20.94	26.52	35.10	42.07	44.12	31.54
3	Spraying PPC	3.00	6.14	8.28	9.81	20.99	32.30	13.42
4	Earthing up	2.02	4.09	4.66	5.41	6.25	7.62	5.01
5	Weeding	120.66	111.63	94.27	75.12	69.74	84.00	92.58
6	Pruning	-	4.49	4.62	6.43	5.90	13.50	5.82
7	Picking/Harvesting	57.54	126.35	167.02	134.00	188.57	123.01	132.76
	Total Labour Man-Days	214.82	287.11	321.07	286.14	355.10	336.19	300.07

Table 4: Cost and Returns Structure of Different Age Groups of Madurai Malli Gardens

S.NO	Particulars	Age of the Garden (IN YEARS)							Average
		1	2	3	4	5	6	7	
1	Cost of cultivation (Rs/acre)	204224.00	148074.00	187462.00	214902.00	250359.00	279579.00	298917.00	229882.00
2	Yield (kg/acre/year)	-	715.36	1543.15	2113.59	2081.94	1976.98	1404.60	1639.27
3	Gross returns (Rs)	0	264175.00	474906.00	656478.00	668958.00	687695.00	541978.00	544031.00
4	Net Returns (Rs/acre)	-204224.00	116101.00	310707.00	469876.00	467463.00	456369.00	301660.00	351962.00

Table 5: Financial Analysis of Madurai Malli Farms (acre)

1.	Net present worth	Rs. 1063636.00
2.	Benefit – Cost Ratio	1.95
4.	Internal Rate of Return	109.25 %
4.	Payback period	1 year and 3 months

Table 6: Credit Gap Experienced by Madurai Malli Growers

YEAR	CREDIT GIVEN (Rs/acre/yr)	TVC (Rs/acre)	CREDIT GAP (Rs/acre)
2	26975.00	135027.00	108052.00
3	26975.00	172873.00	145898.00
4	26975.00	198590.00	171615.00
5	26975.00	232119.00	205144.00
6	26975.00	259183.00	232208.00
7	26975.00	276108.00	249133.00
AVERAGE	26975.00	212317.00	185342.00

CONCLUSIONS

From the results of the study, it can be observed that the total costs incurred in cultivating Madurai malli increased gradually for the total period of crop whereas the gross returns from the crop increased till the year 6 and later decreased. Net return of the crop increased till year four and then declined due to diminishing marginal returns implying Madurai malli growers to take up replanting after the sixth year of cultivation to acquire better profits from the enterprise. The results of the multiple linear regression emphasize that the size of farm holdings, the institutional credit, labour usage, fertilizer used, non-farm income and net returns were the major determinants of total farm investment in Madurai malli farms. The ability to invest largely depended upon farm income surplus and the extent of credit availed.

On the basis of above study it can be concluded that increasing the investment in floriculture helps in the growth of this sector in various aspects. But sufficient credit facilities are required in order to increase the investment since it is evident that the credit amount provided was not enough for the Madurai malli growers in the study area. Hence the following measures can be taken up to solve these problems. Steps should be initiated by the financial institutions to provide credit facilities to floriculture crops. The base of agricultural credit should be enhanced to the large proportion of rural population. Financial institutions however should simplify procedures so that the institutional agencies can become small farmers friendly. The role of credit can be further enhanced by much greater financial inclusion by involving of region-specific market participants, and credit suppliers ranging from public sector banks, co-operative banks, the new private sector banks and micro-credit suppliers, especially self-help groups. The cost of cultivation of the crop may be used by the financial institutions as guidelines for fixing the scale of finance so as to bridge the credit gap prevailing in cultivation. Initiatives can be taken in upgrading the standard of flowers through modern technologies and practices to improve the export of Jasmine in the international market. The beneficiaries should recognize the practice and advantages of accumulated savings, which is often allowed to group when existing facilities are not fully adjusted. This can help the banks to hope that the loan will be paid and usher sustainability of bank and customer friendly relationship. To make the loan more productive special instructions and supervision should be carried out by loan issuing authorities.

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